

**Zadaća 2 – PISP****1. Zadatak**

```
function z1(symbol)
    if nargin ~= 1
        error('Funkcija ima jedan ulazni argument');
    end
    if symbol == 'a'
        z1_a;
        return;
    elseif symbol == 'b'
        z1_b;
        return;
    elseif symbol == 'c'
        z1_c;
        return;
    end
    error('Pogresan argument');
end

syms x y real;

alg1 = x^2 + y^2 - 5 == 0;
alg2 = -3*x + 2*y + 1 == 0;
[sx, sy] = solve(alg1, alg2);

dif_eq = '3*D2y + 5*y = cos(2*x)';
dif_conds = 'y(0) = 1, Dy(0) = 0';

dif_y = dsolve(dif_eq, dif_conds, 'x');

disp('x: ');
pretty(sx);
```

```
disp('y: ');
pretty(sy);

subplot(1, 2, 1);
hold on;
grid on;
plot(sx, sy, 'ks');
title('Algebarske');

subplot(1, 2, 2);
title('Diferencijalne');
ezplot(dif_y, [-5 5]);

syms x real;

funkt = (2 + log(x)) / (sqrt(3*x));
f_dif = diff(funkt);
f_dif2 = diff(f_dif);

zero_x = solve(funkt);
zero_y = subs(funkt, {x}, zero_x);
nula = zero_y;

extr_x = solve(f_dif);
extr_y = subs(funkt, {x}, extr_x);

ha = limit(funkt, inf);

va = solve(sqrt(3*x));
limit(funkt, x, va, 'right');

ezplot(funkt, [-1 8, -4 3]);
```

```
hold on;
grid on;
plot(zero_x, zero_y, 'bs');
plot(extr_x, extr_y, 'ko');
plot([-1 8], [ha ha], 'r');
plot([va va], [-4 3], 'r');

syms R1 R2 R3 R4 R5 R6 R7 V1 V2 Is real;

R = [R1 3 4;
     R2 1 2;
     R3 2 3;
     R4 2 0;
     R5 3 0;
     R6 3 4;
     R7 0 5];

V = [V1 2 3;
     V2 1 0];

I = [Is 5 4];

kolo.V = V;
kolo.R = R;
kolo.I = I;
kolo.simb = 1;

[G, B, C, D, A] = amatrica(kolo);
Z = zmatrica(kolo);

x = A\Z;
```

```
disp('Napon na R3 = ');
pretty(x(2) - x(3));
```

```
disp('Struja kroz V1 = ');
pretty(x(6));
```

## 2. Zadatak

```
function [O,P]=z2(T)
if nargin~=1
    error('Funkcija ima jedan ulazni argument');
end
fn=fieldnames(T);
if numel(fn)<5
    error('Struktura treba imati minimalno 5 elemenata');
end
min_x=T.(fn{1})(1); min_y=T.(fn{1})(2);
max_x=T.(fn{1})(1); max_y=T.(fn{1})(2);
edge_points=[fn{1} fn{1} fn{1} fn{1}];
for i=1:numel(fn)
    x=T.(fn{i})(1); y=T.(fn{i})(2);
    if x>max_x, max_x=x; edge_points(1)=fn{i}; end
    if y>max_y, max_y=y; edge_points(2)=fn{i}; end
    if x<min_x, min_x=x; edge_points(3)=fn{i}; end
    if y<min_y, min_y=y; edge_points(4)=fn{i}; end
    plot(x,y,'ko'); hold on;
end
edge_points=unique(edge_points);
O=(max_x-min_x+max_y-min_y)*2;
P=(max_x-min_x)*(max_y-min_y);
sq_x=[min_x max_x max_x min_x min_x];
sq_y=[min_y min_y max_y max_y min_y];
grid on; plot(sq_x,sq_y,'r');
```

```

xlim([min_x-1 max_x+1]); ylim([min_y-1 max_y+1]);
disp(['Tačke na rubu kvadrata: ' edge_points]);
end

```

### 3. Zadatak

```

f1=figure('Tag','Figure 1','Menubar','none','Units','normalized','Position',[0.35 0.2 0.3 0.6]);
uicontrol('Style','Text','String','APROKSIMACIJA PODATAKA
SUMA','Units','normalized','FontSize',12,'Position',[0.1 0.89 0.8 0.05],'parent',f1);
uicontrol('Style','Text','String','Polinom i
interval','Units','normalized','FontSize',10,'Position',[0.07 0.82 0.18 0.05],'parent',f1);
polinom=uicontrol('Style','Edit','Units','normalized','FontSize',12,'HorizontalAlignment','Left','
Position',[0.3 0.82 0.18 0.05],'parent',f1);
interval=uicontrol('Style','Edit','Units','normalized','FontSize',12,'HorizontalAlignment','Left','
Position',[0.52 0.82 0.18 0.05],'parent',f1);
popup=uicontrol('Style','Popup','String','|+|*|o|x','Callback','draw','Units','normalized','Position
',[0.72 0.803 0.18 0.05],'parent',f1);
m1=uimenu(f1,'Label','Vrsta Linije');
uimenu(m1,'Label','isprekidana','Callback','set(findobj(gcf,"Tag","linija"),"LineStyle","--");
uimenu(m1,'Label','tackasta','Callback','set(findobj(gcf,"Tag","linija"),"LineStyle",".");
uimenu(m1,'Label','puna','Callback','set(findobj(gcf,"Tag","linija"),"LineStyle","-");
grafik=axes('Position',[0.1 0.10 0.8 0.63],'parent',f1);

```

```

function z=zmatrica(sistem)
v=sistem.V(:,1)'; r_od=double(sistem.R(:,2))'; r_do=double(sistem.R(:,3))';
broj_cvorova=max([r_od r_do]);
if isfield(sistem,'I')
i_od=double(sistem.I(:,2))'; i_do=double(sistem.I(:,3))'; it=sistem.I(:,1);
br_st_izvora=length(i_od);
if sistem.simb, b1=sym(zeros(1,broj_cvorova));
else, b1=zeros(1,broj_cvorova); end
for i=1:br_st_izvora
if i_od(i)>0, b1(i_od(i))=b1(i_od(i))-it(i); end
if i_do(i)>0, b1(i_do(i))=b1(i_do(i))+it(i); end
end

```

```
else, b1=zeros(1,broj_cvorova);
end
z=[b1,v]';
end
```

Primjer pokretanja:

